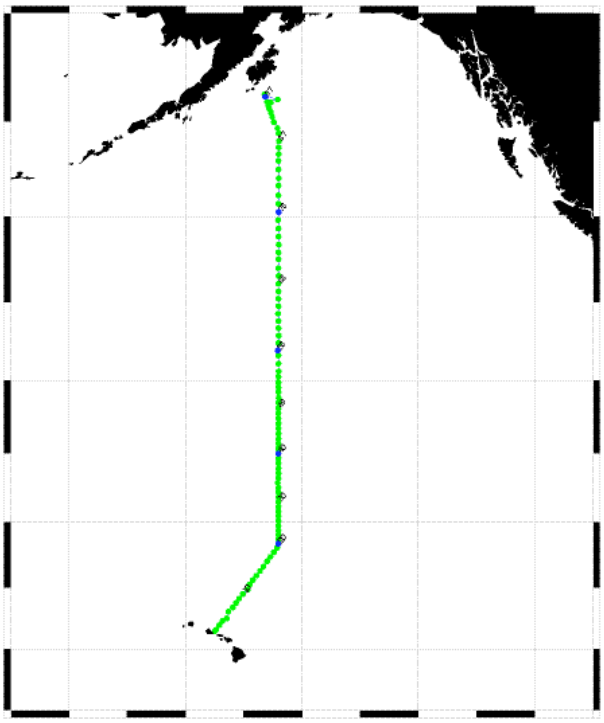
CRUISE REPORT: P16_1984a

(Updated NOV 2007)



A. HIGHLIGHTS

A.1. CRUISE SUMMARY INFORMATION

WOCE section designation	**P16_1984a**
Expedition designation (ExpoCodes)	**31WTMARAII**
Chief Scientists	**Roland A. de Szoeke/OSU** **Lynne D. Talley/SIO**
Dates	4 MAY 1984 to 4 JUN 1984
Ship	*R/V THOMAS WASHINGTON*
Ports of call	Honolulu, Hawaii to Kodiak, Alaska
Station geographic boundaries	56° 18' N 157° 28.4' W 151° 56.1' W 21° 28.1' N
Stations	98
Floats and drifters deployed	0
Moorings deployed or recovered	2 current meter moorings recovered

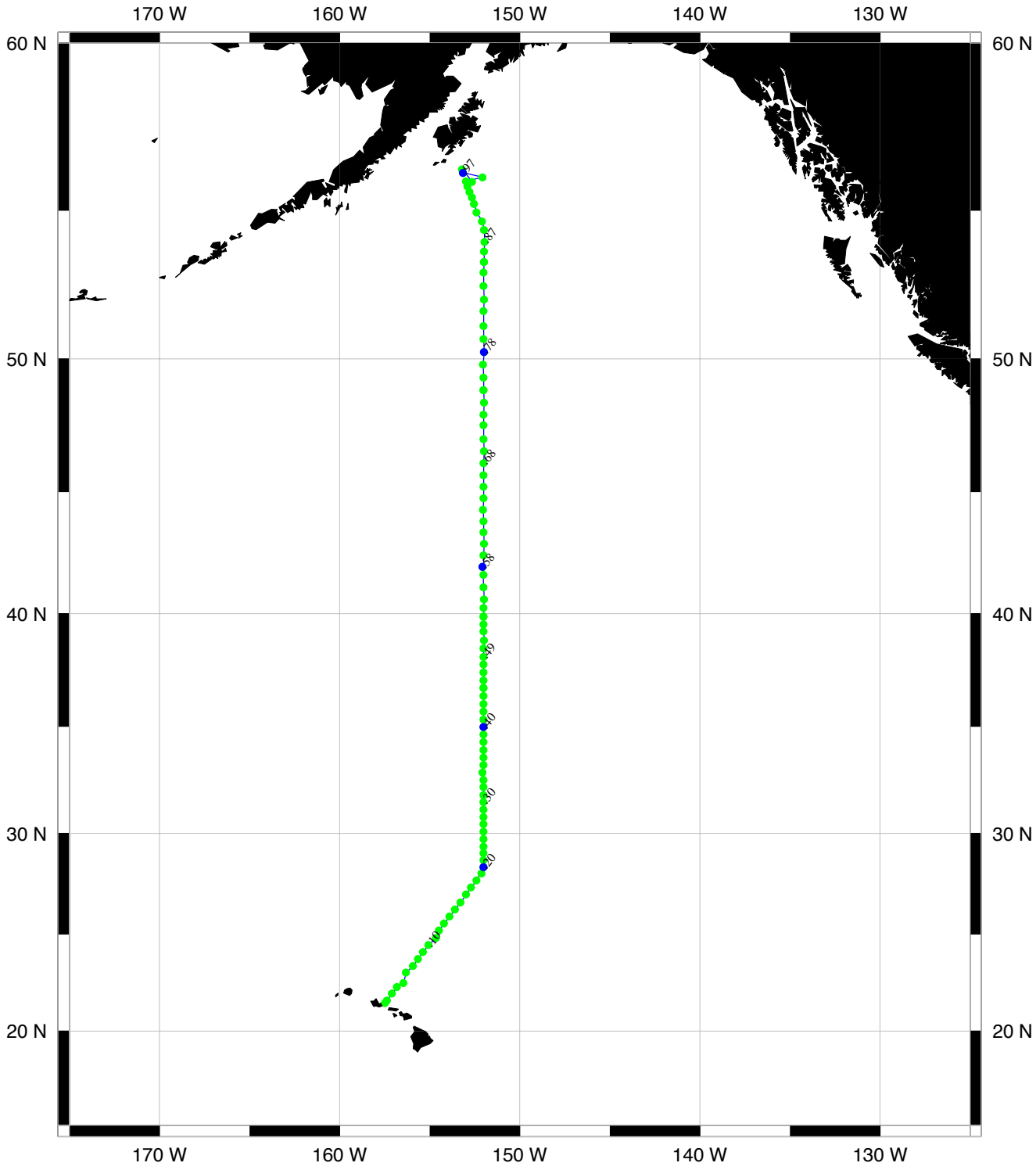
Chief Scientists:	
Roland A. de Szoeke, Professor Emeritus Oregon State University Szoeke @coas.oreganstate.edu	Lynne D. Talley, Professor Scripps Institution of Oceanography • UCSD 9500 Gilman Dr. • MS 0230 • La Jolla, CA 92093 Phone: 858-534-6610 • Fax: 858-534-9820 ltalley@ucsd.edu • WWW: http://sam.ucsd.edu

CRUISE AND DATA INFORMATION

Links to text locations. Shaded sections are not relevant to this cruise or were not available when this report was compiled

Cruise Summary Information	Hydrographic Measurements
Description of Scientific Program	**CTD Data:**
Geographic Boundaries	Acquisition
Cruise Track (Figure): PI CCHDO	Processing
Description of Stations	Calibration
Description of Parameters Sampled	Salinities
Bottle Depth Distributions (Figure)	Oxygens
Floats and Drifters Deployed	**Bottle Data**
Moorings Deployed or Recovered	Salinity
	Oxygen
Principal Investigators	Nutrients
Cruise Participants	Carbon System Parameters
	Helium / Tritium
Problems and Goals Not Achieved	Radiocarbon
Other Incidents of Note	
Underway Data Information	**References**
Navigation Bathymetry	
Acoustic Doppler Current Profiler (ADCP)	
Thermosalinograph	
XBT and/or XCTD	
Meteorological Observations	**Acknowledgments**
Atmospheric Chemistry Data	
Data Processing Notes	

Station locations P16_1984 • TALLEY / de Szoeke • R/V Thomas Washington



Produced from .sum file by CCHDO/SIO

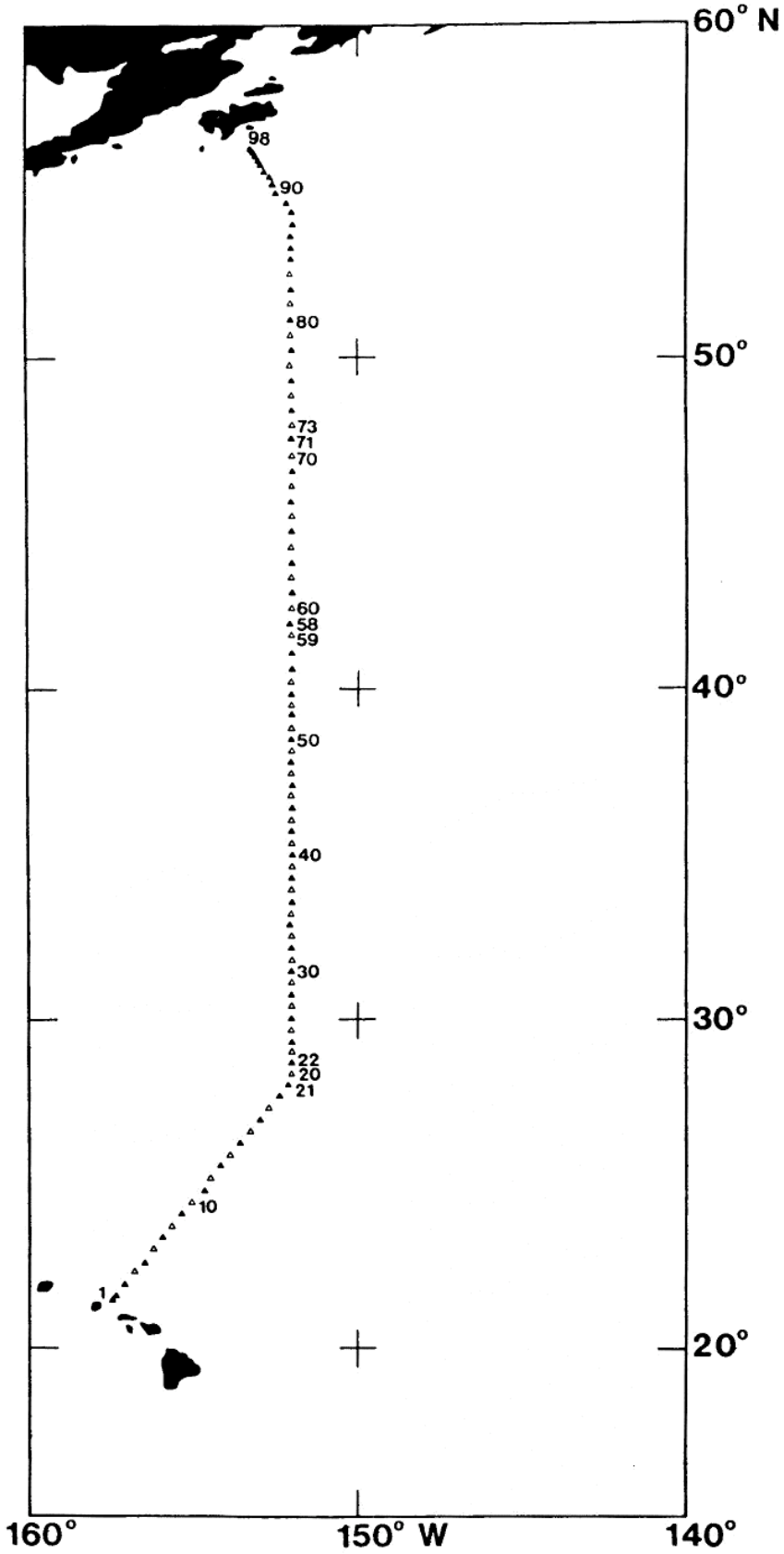


Figure 1. Station positions for the Marathon II section on the R/V Thomas Washington May 4 - June 4 1984.

OREGON STATE UNIVERSITY
COLLEGE of OCEANOGRAPHY
CORVALLIS OREGON 97331

PHYSICAL, CHEMICAL AND CTD DATA

from the

MARATHON II EXPEDITION

R/V Thomas Washington 261
4 May - 4 June 1984

by

Margie Martin
Lynne D. Talley
Roland A. de Szoeke

Data Report 131
Reference 87-15
May 1987

National Science Foundation OCE-8316930
Office of Naval Research N00014-84-C0218

CONTENTS

INTRODUCTION

The hydrographic and CTD data presented in this report were collected aboard the RV Thomas Washington on the second leg of the Marathon Expedition, from Honolulu, Hawaii to Kodiak, Alaska (4 May - 4 June, 1984). The NODC identification number for the cruise is TW 261. The objective of the expedition was to provide information about the general circulation from the sea surface to the bottom in the northeastern Pacific with sufficient resolution along the cruise track to resolve the spacing of fronts and the scale of eddy variability. Except in boundary regimes at the beginning and end of the cruise where all stations extend from top to bottom, stations alternated between full water column coverage and coverage to 1500 meters. Station spacing between 28°N and 42°N was decreased in order to better sample the active frontal region. During the cruise, current meter moorings at 28°N and 42°N were retrieved and reset for P. Niiler by a separate group aboard the ship.

The hydrographic and CTD data presented in this report were collected and processed by the Physical and Chemical Oceanographic Data Facility (now part of the Shipboard Technical Support Group) at Scripps Institution of Oceanography. The hydrographic and 2-db CTD data have been sent to the National Oceanographic Data Center. Note that there is no station 72 on the cruise.

STANDARD PROCEDURES

Hydrographic (Rosette) Data

Each station consisted of a CTD lowering with a rosette carrying 24 Niskin bottles. Most stations included four reversing thermometer racks with one at the surface, one at the bottom, and the others at widely spaced intervals. Water samples were collected on the upcast and analyzed for salinity, oxygen, silicate, phosphate, nitrate, and nitrite. Samples for tritium analysis were collected for Dr. R. Fine and were processed by the Tritium Laboratory at the University of Miami.

Pressure and temperature for the discrete hydrographic tabulations were taken from the calibrated CTD data. The CTD pressure and temperature calibrations are discussed in the following section. Occasional discrepancies between the bottom depth listed in the header record and the maximum depth of the station resulted from incompatibility of the depth as read from the PDR and the actual depth of the cast.

Depths were calculated from CTD pressures (Saunders, 1981).

Salinity samples were analyzed at sea using one of two Guildline Autosal inductive salinometers. All salinity values are calculated from conductivity using the 1978 practical salinity scale (UNESCO, 1981) and are tabulated to three decimal places. Standard seawater batch P92 was used to standardize the salinometer at the beginning and end of each station; salinities are reported relative to P92 and have not been adjusted further. Mantyla (1987) compared various batches of standard seawater with batch P96; he found that the salinity of P92 is about 0.003 ‰ less than that of P96. A section made in 1985 which intersected the Marathon II section and on which P96 was used as a standard showed salinities in the deep water which were indeed about 0.003 ‰ higher than Marathon II, indicating that the laboratory comparisons hold in situ and that the precision of the Autosal measurements is high. Bottle salinities were compared with CTD salinities to identify leaking bottles or salinometer malfunctions. Calibrated CTD salinities were used to replace bottle salinities in the event of problems and are indicated by the letter "D" in the hydrographic data tables. All salinities on station 34 were replaced by CTD salinities because of extensive drift in the autosalinometer standardization from the beginning to the end of that station's analysis; because the CTD salinities were calibrated using a large group of adjacent stations, the CTD salinities for station 34 are nearly as precise as those from bottle data.

Dissolved oxygen was determined by the Winkler method as modified by Carpenter (1965), using the equipment and procedure outlined by Anderson (1971). A small number of oxygen values were discarded

because contamination by rusty springs in the Niskin bottles resulted in low values. The bad springs caused greater problems with phosphate measurements. The precision of oxygen measurements is .01 mill and accuracy is 2%.

Silicate, phosphate, nitrate and nitrite were analyzed at sea using an autoanalyzer. The procedures used are similar to those described in Atlas et al. (1971). Artificial seawater was used as a standard for the first 19 stations; this resulted in high values for all nutrients and was corrected by reducing the absorbance slope by 6.25% for these stations. During the early part of the cruise, the springs in a large number of Niskin bottles rusted as a result of inadequate coating. Most rusty springs were replaced after station 21. Phosphate measurements were the most strongly affected; hence a large number of phosphate measurements have been deleted from stations 1 to 21. Two bottles continued to cause problems on subsequent stations; all phosphate values from these bottles have been deleted. Oxygen measurements were also affected, but apparently less severely; oxygens have been deleted from a smaller number of stations. Silicate, nitrate, nitrite, and salinity values were apparently unaffected by the rusted springs. Nitrate measurements on station 80 have been deleted because of problems with the cadmium column in the autoanalyzer. A portion of the silicate values on station 87 were adversely affected by a 2°C change in the laboratory temperature and have been deleted.

The precision of nutrient measurements is estimated to be less than .5% and accuracy is 2% to 3%.

Conductivity/Temperature/Depth (CTD) Data

A single Neil Brown Mark III CTD was used for all casts. The time series data were processed and calibrated by PACODF; the final product is a 2 db pressure series.

Pressure, temperature, and conductivity were sampled at 32 frames/second and recorded on audio tape. Output from the oxygen probe was updated at 8 frames/second and recorded with the other three parameters; it was not processed. The audio tapes were digitized following the cruise. There was no obvious increase in noise due to digitization following the cruise; however, gaps in the final data for stations 13 and 42 resulted from yoyo's made to compensate for the ends of audio tape reels.

Pressure, temperature and conductivity data were block-averaged in one second intervals. Values which were more than four standard deviations from the average were eliminated, the average was recalculated, and values more than 2 standard deviations from the average were discarded.

The CTD pressure transducer was calibrated in a temperature-controlled bath to the PACODF Ashcroft deadweight-tester pressure standard. Thermal response-time, thermal hysteresis and mechanical hysteresis were measured. The mechanical hysteresis loading curves were measured at 0°C and 23°C and at maximum loadings of 2225 and 8825 PSI. The transducer thermal response time was derived from the pressure response to a thermal step change from 21°C to 0°C. There was no significant difference between pre- and post-cruise calibrations. Pressure calibrations were applied to the 1-second averages using a family of hysteresis curves based on the laboratory calculations. There was no significant drift in comparisons between CTD and thermometric pressures, based on reversing thermometers mounted on an average of 4 bottles on every cast. The mean difference between calibrated CTD pressures and thermometric pressures was 2.5 db.

The CTD platinum resistance thermometer was calibrated in a temperature-controlled bath to the PACODF Leeds and Northrup PRT temperature standard at 0°C, 10°C and 25°C. Calibrations were performed before and after the cruise: there was a .002 to .003° decrease in the CTD temperature reading. In addition to a constant second-order slope applied to all casts as a result of the PRT calibrations, an offset that was linear as a function of time was applied to the full cruise to compensate for the shift between pre- and post-cruise calibrations. The mean difference between CTD temperatures and thermometer values was -0.0005°C.

After pressure and temperature calibration, the up and downcast CTD salinities differed by no more than .001 ‰ in the deep water, except on a few stations which had obvious offsets in conductivity.

Conductivity was calibrated using bottle salinities collected on the upcasts. Bottle sample conductivities were calculated from the sample salinities and from CTD pressures and temperatures. A conductivity slope correction was calculated as a third order least-squares fit to station number. After application of the slope correction, a conductivity offset for each cast was calculated and applied. All bottle samples were used for calibration with heavier weighting of samples below 1000 db. The mean difference between final CTD conductivities and sample conductivies was 0.00073 mhos. Additional offset corrections were made following comparisons of calibrated downcast salinities with bottle salinities in order to account for discontinuous shifts in the conductivity transducer response.

After processing the time series, a roll filter was applied to eliminate pressure reversals and a 2 db pressure series was constructed by block-averaging all 1-second values within each 2 db bin. The final data set contains .46% missing data or 727 of 168,549 data points. Most missing data are at single levels and result from block-averaging in one second intervals followed by pressure sequencing. Eleven of the 98 stations account for 423 missing values, or more than half. The only blocks of missing data are 3422-3438 db at station 13 and 4438-4484 db at station 42, both due to large yo-yo's occasioned by operator compensation for the end of audio tape recordings.

Seven upcasts were sent instead of downcasts because of major offsets or other instrument-related problems on the downcasts. The up-casts are stations 29, 50, 80, 82, 84, 85, and 89.

DATA

The data presentation consists of the cruise track, vertical sections, listings of all discrete hydrographic data, a subsample of the CTD data, plots of temperature and salinity as a function of pressure, and plots of potential temperature as a function of salinity.

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UNESCO, 1981. Background papers and supporting data on the International Equation of State 1980. UNESCO Tech. Pap. in Mar. Sci., No. 38.

PERSONNEL

Ship's Captain, RV Thomas Washington

Johnson, Curds D.

Scientific personnel participating in collection of hydrographic/CTD data

de Szoeke, Roland (chi sci)	Professor	College of Oceanography	OSU
Talley, Lynne D. (co-chi sci)	Research Oceanographer	Ocean Research Division	SIO
Boaz, John	Marine Technician	STS	SIO
Field, Timothy J.	Marine Technician	PACODF	SIO
Hester, Arthur W.	Staff Research Associate	PACODF	SIO
Martin, Margie	Staff Research Associate	Marine Life Research Gp	SIO
Mattson, Carl W.	Electronics Technician	PACODF	SIO
Moe, Ronald	Programmer	Shipboard Computer Gp	SIO
Muus, David A.	Staff Research Associate	PACODF	SIO
Paduan, Jeffrey	Graduate Student	College of Oceanography	OSU
Wenzel, Jan	Graduate Student	UH	

Additional personnel involved in data processing

Beaupre, Marie-Claude C.	Staff Research Associate	PACODF	SIO
Delahoyde, Frank M.	Programmer/Analyst	PACODF	SIO
Johnson, Mary C.	Staff Research Associate	PACODF	SIO
Sweet, Paul	Staff Research Associate	PACODF	SIO
Wells, James A.	Marine Technician	PACODF	SIO

Abbreviations

OSU	Oregon State University
PACODF	Physical and Chemical Ocean Data Facility
SIO	Scripps Institution of Oceanography
STS	Ship Board Technical Support
UH	University of Hawaii

FIGURES

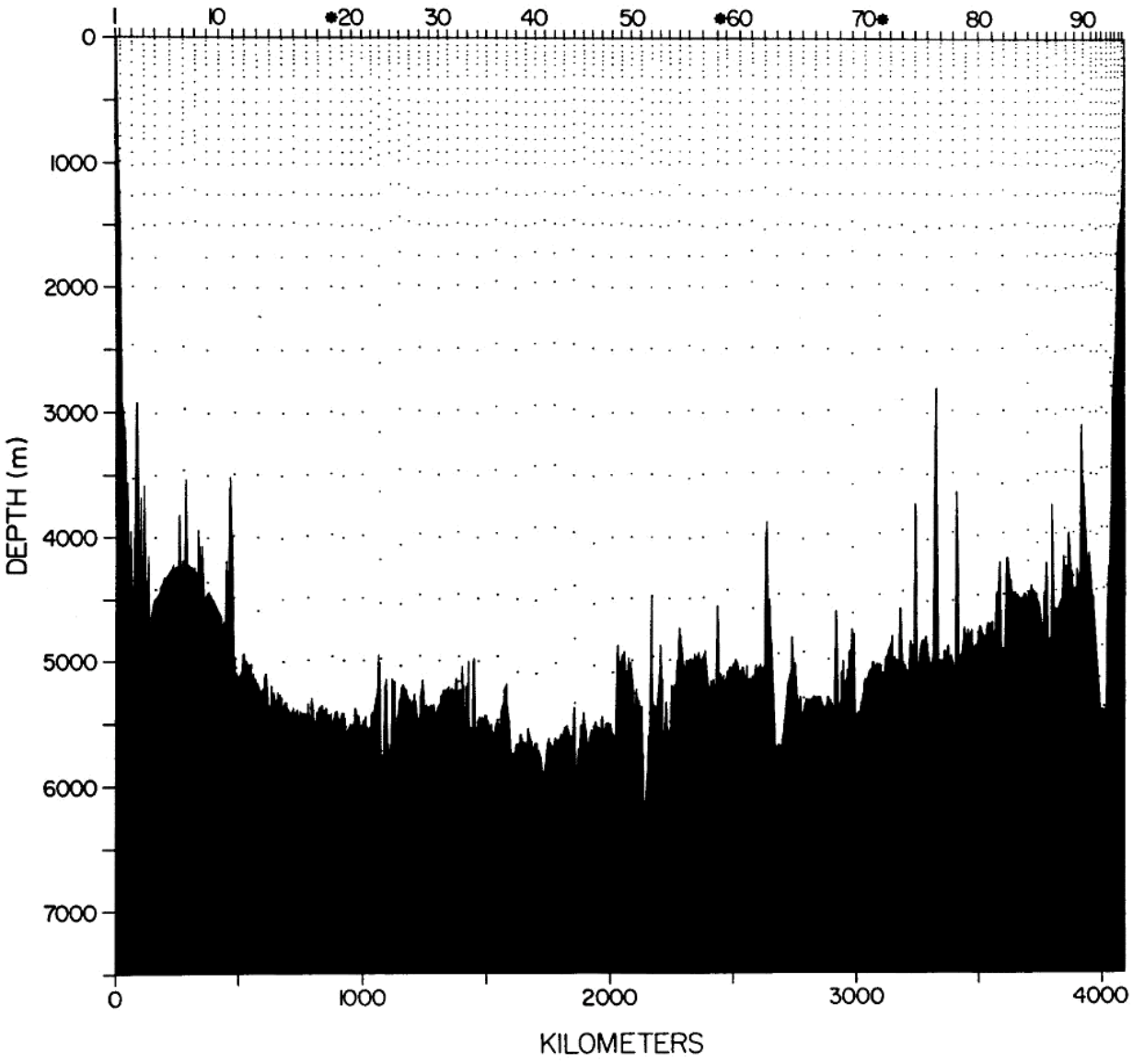

Figure 2. Bottle positions. Asterisks indicate irregularities in station numbering.

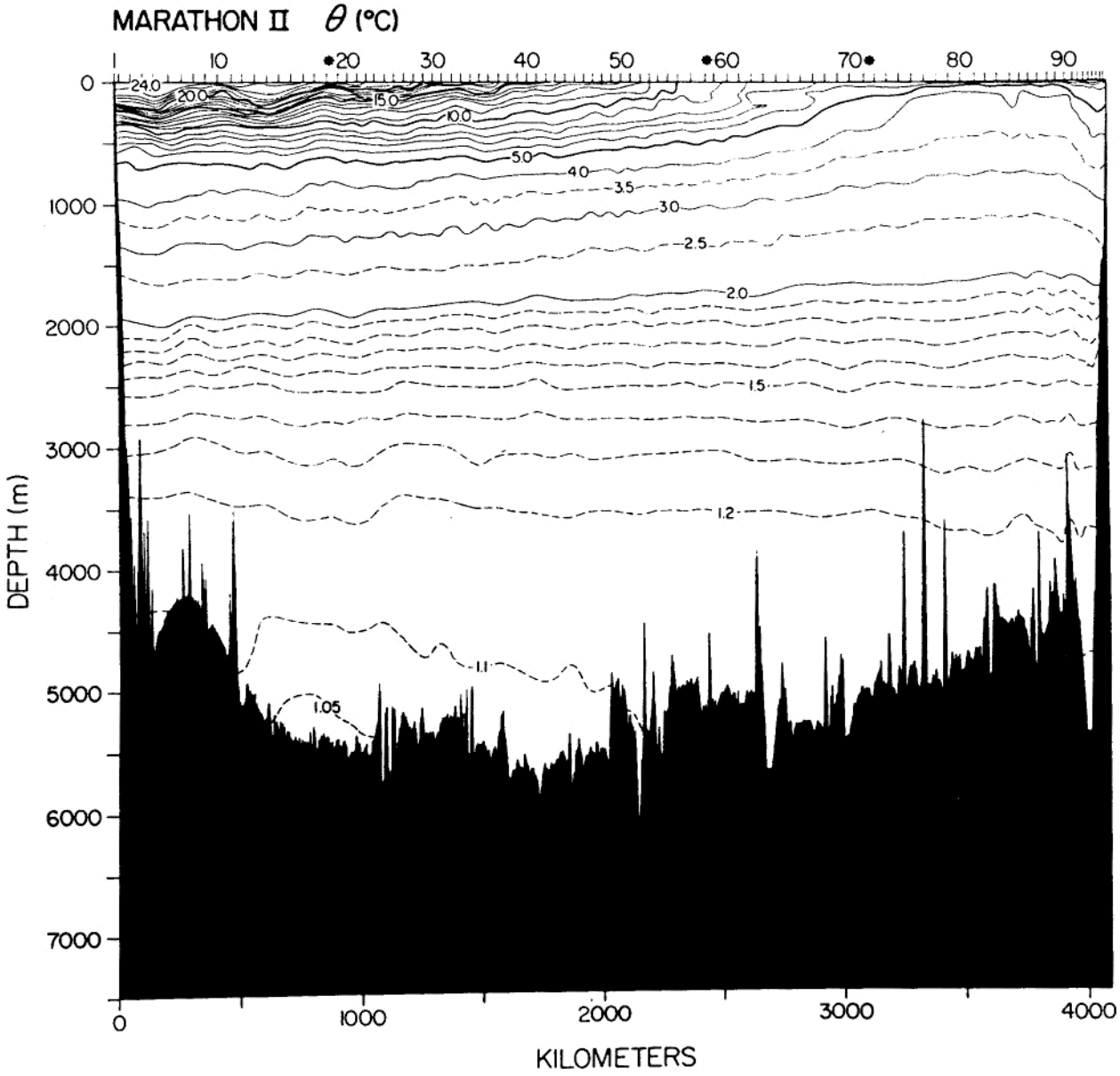

Figure 3. Potential temperature section.

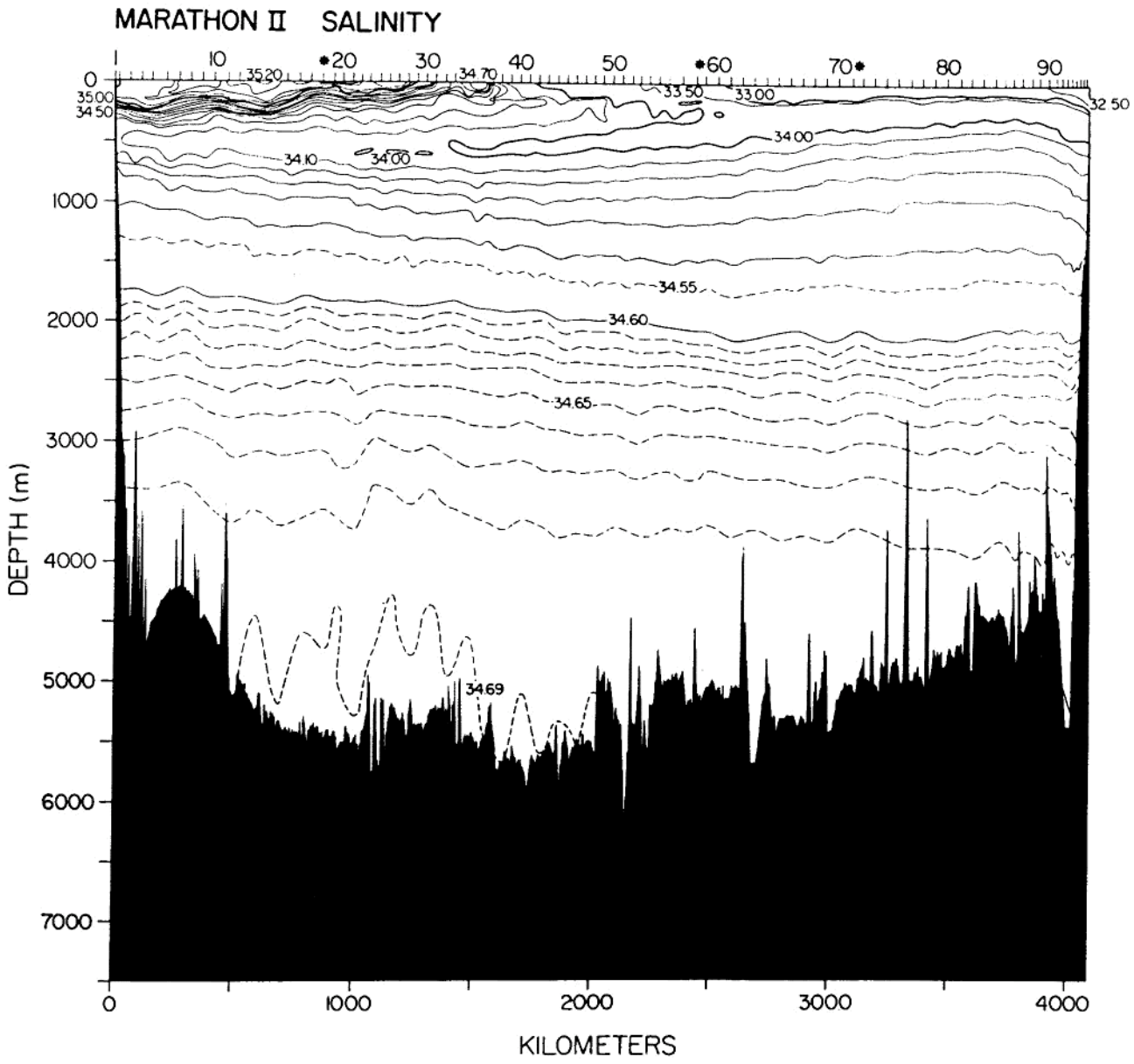

Figure 4. Salinity section.

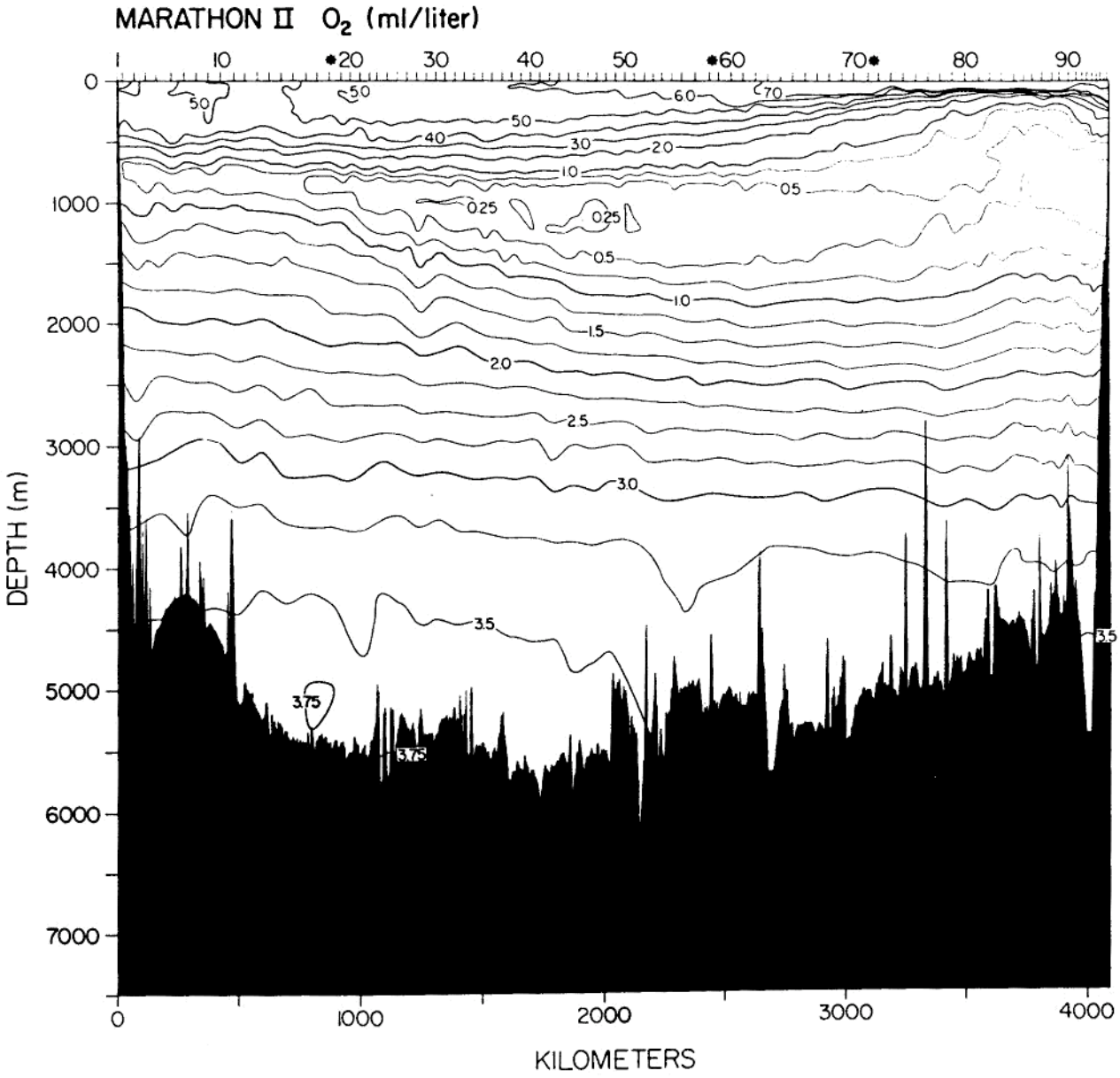

Figure 5. Oxygen section.

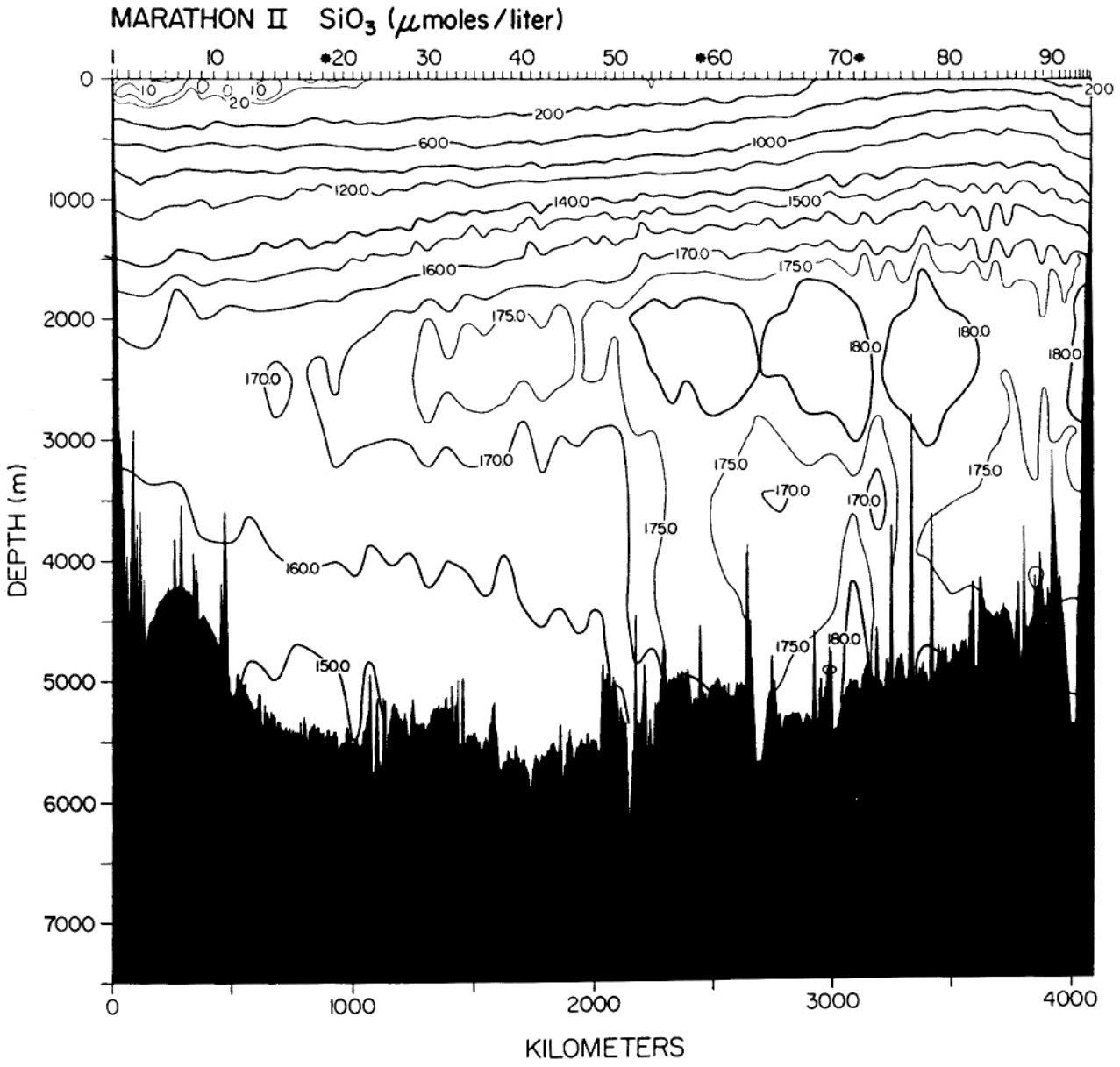

Figure 6. Silicate section.

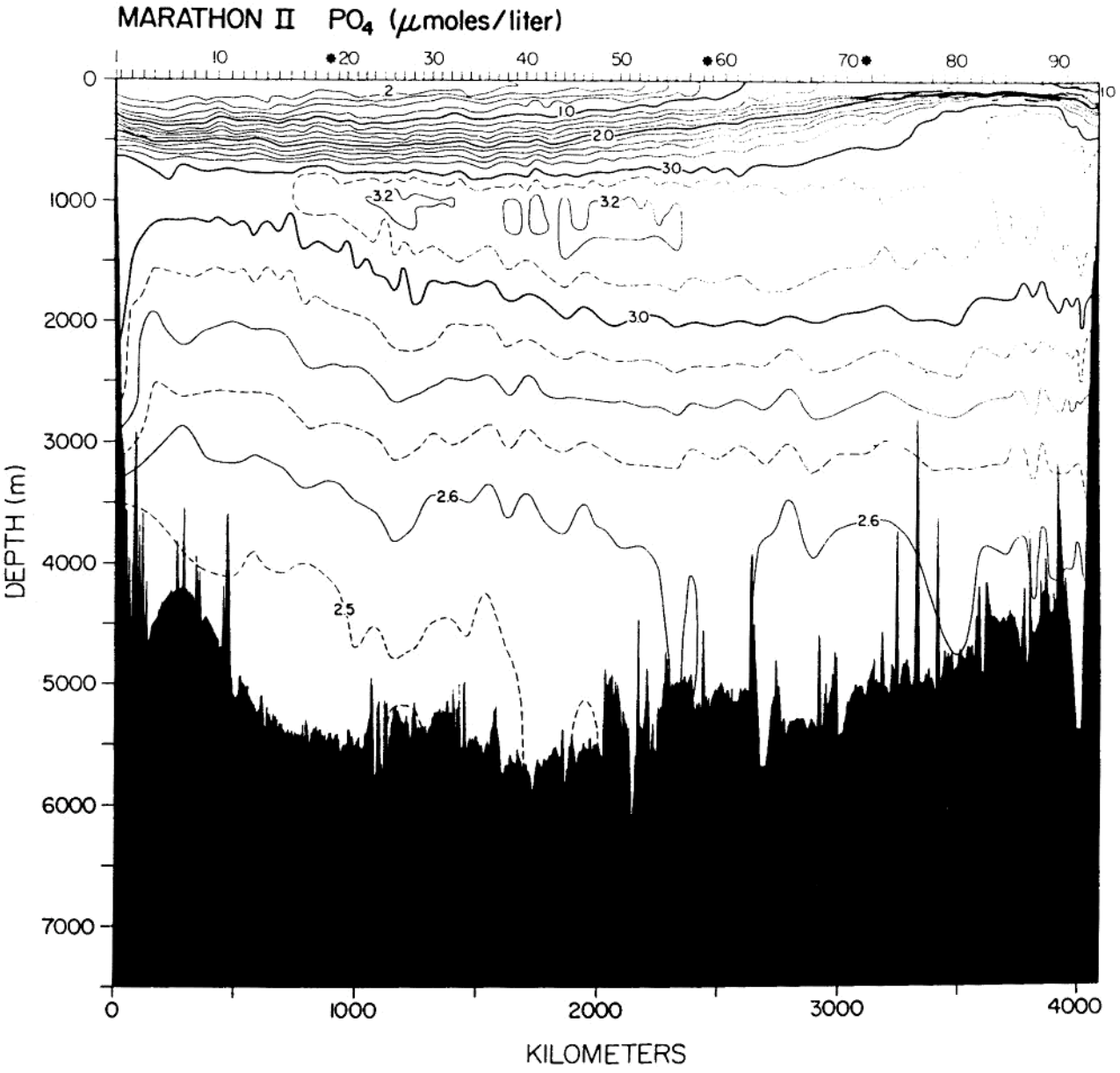

Figure 7. Phosphate section.

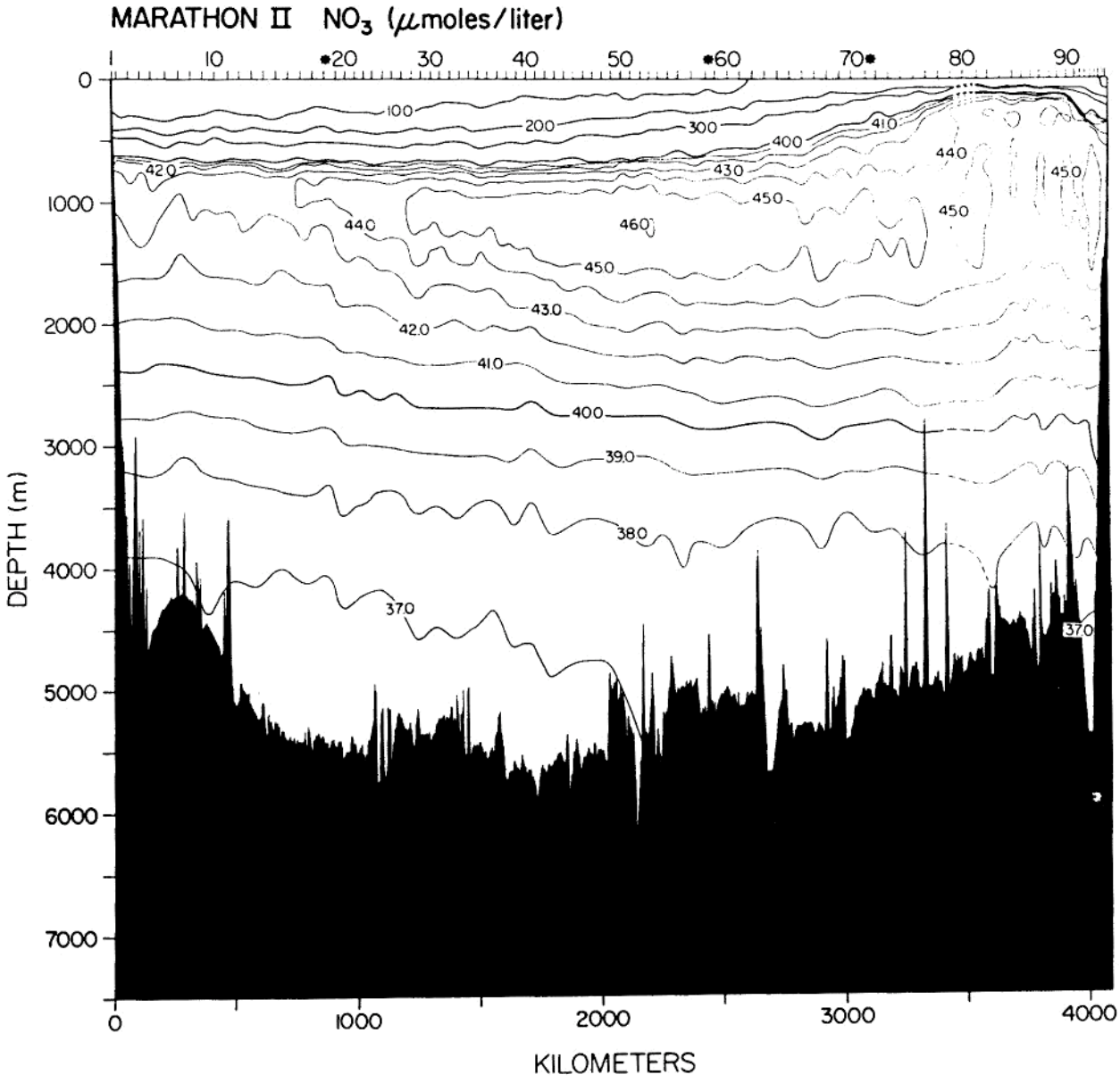

Figure 8. Nitrate section.

R/V THOMAS WASHINGTON
MARATHON LEG 2
May 5 1984 to June 4 1984

Station	Date GMT	Time GMT	Latitude	Longitude	Depth M	Number of Samples
1	05/05/84	736	21 28.1 N	157 28.4 W	746	11
2	05/05/84	1342	21 35.9 N	157 21.1 W	3000	18
3	05/05/84	2054	21 57.2 N	157 4.5 W		18
4	05/06/84	724	22 18.0 N	156 48.0 W	3905	16
5	05/06/84	1330	22 30.5 N	156 26.0 W	4439	22
6	05/06/84	1942	23 2.5 N	156 18.1 W		19
7	05/07/84	130	23 23.5 N	155 55.7 W	4194	23
8	05/07/84	818	23 45.0 N	155 38.4 W	4340	16
9	05/07/84	1436	24 6.0 N	155 21.0 W	4364	23
10	05/07/84	2042	24 28.0 N	155 3.6 W	3128	17
11	05/08/84	306	24 48.3 N	154 37.8 W	5144	23
12	05/08/84	800	25 11.0 N	154 28.6 W	4990	17
13	05/08/84	1500	25 32.5 N	154 11.0 W	5266	23
14	05/08/84	2042	25 54.0 N	153 53.4 W	5400	18
15	05/09/84	300	26 15.5 N	153 35.7 W	5382	24
16	05/09/84	854	26 36.4 N	153 16.4 W	5322	17
17	05/09/84	1454	26 59.2 N	152 57.7 W	5493	24
18	05/09/84	2054	27 20.0 N	152 41.9 W	5379	18
19	05/10/84	242	27 41.6 N	152 23.6 W	5513	23
20	05/10/84	1024	28 21.3 N	152 0.4 W	5482	17
21	05/11/84	224	28 1.9 N	152 6.0 W	5544	23
22	05/11/84	942	28 42.5 N	152 0.3 W	5602	24
23	05/12/84	1312	29 2.8 N	152 0.1 W	5611	17
24	05/12/84	2036	29 21.3 N	151 59.8 W	5363	24
25	05/13/84	324	29 43.8 N	152 0.8 W	5586	17
26	05/13/84	918	30 4.6 N	152 0.8 W	5317	24
27	05/13/84	1524	30 26.4 N	152 0.3 W	5312	17
28	05/13/84	2124	30 47.5 N	152 0.0 W	5435	24
29	05/14/84	524	31 8.9 N	152 0.0 W	5420	17
30	05/14/84	1112	31 29.8 N	152 0.7 W	5458	24
31	05/14/84	1718	31 50.3 N	151 59.2 W	5219	17
32	05/14/84	2306	32 12.3 N	152 0.4 W	5293	23
33	05/15/84	530	32 32.8 N	152 0.6 W	5229	17
34	05/15/84	1212	32 54.3 N	152 2.7 W	5503	24
35	05/15/84	1854	33 14.4 N	152 0.6 W	5456	17
36	05/16/84	124	33 35.2 N	151 59.6 W	5461	24
37	05/16/84	736	33 56.5 N	151 59.8 W	5015	17
38	05/16/84	1418	34 18.4 N	152 0.1 W	5687	24
39	05/16/84	2048	34 39.3 N	151 59.8 W	5663	17
40	05/17/84	324	35 0.0 N	151 59.2 W	5722	24
41	05/17/84	942	35 20.7 N	151 59.5 W	5798	17
42	05/17/84	1630	35 42.6 N	151 59.9 W	5611	24

Station	Date GMT	Time GMT	Latitude	Longitude	Depth M	Number of Samples
43	05/17/84	2254	36 3.2 N	151 59.8 W	5529	17
44	05/18/84	542	36 24.8 N	151 59.5 W	5374	24
45	05/18/84	1600	36 46.2 N	151 59.9 W	5528	17
46	05/18/84	2224	37 6.5 N	151 58.8 W	5539	24
47	05/19/84	436	37 27.1 N	152 0.7 W	5565	17
48	05/19/84	1036	37 48.0 N	152 0.4 W	5886	24
49	05/19/84	1642	38 8.8 N	151 59.2 W	4936	17
50	05/19/84	2224	38 30.3 N	152 0.3 W	5255	24
51	05/19/84	430	38 50.9 N	151 59.1 W	5358	17
52	05/20/84	1042	39 14.3 N	151 59.2 W	5503	22
53	05/20/84	1724	39 33.3 N	152 0.4 W	5157	16
54	05/21/84	418	39 52.9 N	151 59.8 W	5606	24
55	05/21/84	1118	40 15.2 N	152 0.3 W	4885	14
56	05/22/84	736	40 37.4 N	151 59.0 W	4993	24
57	05/22/84	1424	41 6.8 N	151 59.5 W	4959	24
58	05/23/84	706	41 59.1 N	152 3.0 W	5103	24
59	05/23/84	1254	41 38.9 N	151 59.7 W	5090	17
60	05/24/84	948	42 27.6 N	151 59.5 W	5111	17
61	05/24/84	1624	42 55.2 N	151 58.8 W	5149	24
62	05/24/84	2348	43 23.0 N	152 0.4 W	4762	17
63	05/25/84	618	43 49.7 N	151 59.4 W	5689	24
64	05/25/84	1212	44 17.6 N	152 1.0 W	5096	17
65	05/25/84	1724	44 45.3 N	152 0.0 W	5305	24
66	05/25/84	2312	45 12.6 N	151 59.8 W	5298	17
67	05/26/84	518	45 39.9 N	152 0.6 W	5374	24
68	05/26/84	1118	46 7.3 N	151 59.9 W	5322	17
69	05/26/84	1730	46 34.7 N	151 59.0 W	4854	24
70	05/26/84	2348	47 2.3 N	151 59.6 W	5206	17
71	05/27/84	554	47 34.2 N	151 59.8 W	5009	24
73	05/27/84	1206	47 57.9 N	151 59.7 W	4849	17
74	05/27/84	1924	48 25.0 N	151 59.0 W	5019	24
75	05/28/84	254	48 52.2 N	152 0.1 W	4058	17
76	05/28/84	900	49 19.7 N	151 59.4 W	4996	24
77	05/28/84	1524	49 47.8 N	152 1.1 W	4897	17
78	05/28/84	2124	50 15.1 N	151 59.0 W	5110	24
79	05/29/84	418	50 42.4 N	152 0.7 W	4993	16
80	05/29/84	1012	51 9.7 N	152 0.0 W	4781	24
81	05/29/84	1648	51 40.9 N	151 59.4 W	4695	16
82	05/29/84	2324	52 4.7 N	151 58.2 W	496	24
83	05/30/84	530	52 32.0 N	152 0.6 W	4467	17
84	05/30/84	1136	52 59.9 N	151 59.4 W	4448	24
85	05/30/84	1948	53 20.5 N	151 58.9 W	4531	24
86	05/31/84	212	53 41.1 N	151 58.9 W	4846	24
87	05/31/84	842	54 0.5 N	151 56.1 W	4572	24
88	05/31/84	1530	54 23.1 N	151 57.8 W	4156	24
89	05/31/84	2218	54 40.2 N	152 5.3 W	4316	24
90	06/01/84	518	54 57.4 N	152 23.9 W	4127	24

Sta-tion	Date GMT	Time GMT	Latitude	Longitude	Depth M	Number of Samples
91	06/01/84	1218	55 13.9 N	152 31.5 W	4451	24
92	06/01/84	1900	55 25.6 N	152 38.1 W	5155	24
93	06/02/84	154	55 35.9 N	152 46.3 W	5377	24
94	06/02/84	806	55 46.6 N	152 53.0 W	4405	24
95	06/02/84	1336	55 56.3 N	152 57.6 W	2665	23
96	06/02/84	1824	56 4.0 N	153 2.7 W	1801	18
97	06/02/84	2242	56 12.0 N	153 7.7 W	1340	15
98	06/03/84	218	56 18.0 N	153 12.4 W	303	8

CCHDO Data Processing Notes

Date	LastName	Data Type	Action	Summary
2003-11-13	Sanborn	SUM	Update Needed	Time & lat/long changes
	Station 7: hour/min is wrong for EN			Time should be 0405
	Station 28: hour/min is wrong for BE			Time should be 1938
	Station 43: longitude should probably be 159			Longitude should be 151
2003-11-26	Sanborn	BTL/SUM	Reformatted	May still need QC
	I did convert it, the bottle data, to WOCE format. I sent Lynne a *.sea and *.sum file. I wanted to do a little fine-tuning on it, not data changes, but more likely quality code consistency.			
2004-01-07	Anderson	CTD/BTL/SUM	Data Updated:	Data & formatting corrections
	.sum Corrected time for sta. 7, EN. Had 4050 changed to 0405. See Sandborn, 2003-11-13). Corrected time for sta. 28, BE. Had 2938 changed to 1938. See Sandborn, 2003-11-13). Corrected longitude for sta. 43. Had 159 changed to 151. See Sandborn, 2003-11-13). Stations 28, 32, 43, 46, 50, 54, 62, 66, 70, and 82 are stations that start on one day and end the next day after midnight. All of these stations had the wrong day for EN, I changed them to the correct day. Station 36 had the day for BE as 16 and it should have been 15. I changed it to 15. Station 45 has a time of 0000 for BE, BO, and EN, I left it that way. Station 51 had the day for BE, BO, and EN as 19. It should have been 20, so I changed it to 20. Station 89 had the month as 05 and the day as 31 for EN. It should have been month 06 and day 01, so I changed it. Removed CR's from end of lines. Some adding and deleting of spaces to make file conform to the WHP format. .sea Removed the Q1 and Q2 flags for REVPRS and REVTMP and eliminated the *'s under those parameters. .ctd The ctd's were all in one file. Broke the file into individual stations, and added headers. There were no Q1 flags, so I put 9 for all the -9.0 values and 2 for all the other values. In order to get sta. 3 and sta. 6 converted to exchange I had to put a bogus bottom UNC DEPTH in the .sum file. This was only used for the conversion to exchange.			
2004-01-13	Bartolacci	CTD/BTL	Website Updated:	Files online w/ netCDF bottle file errors
	Upon conversion to netcdf, the exchange CTD files were opened to find one more .csv CTD file than original woce ctd files. I've been trying to figure out why the exchange conversion generated a file with no station number but have been unsuccessful. It has valid data in it that belongs to station 3 but no header information. However, station 3 also has a normal .csv file generated as well. This problem remains unsolved at this time. I've renamed the CTD files to indicate the correct directory name and they converted to netCDF fine (no extra files were generated). Bottle file converted to netCDF, but nitrite values are getting listed as blanks (even though the original and csv files have values). This is also unclear at this time and there are no format checking tools for netCDF at this time. All files have been put online, however the errors with the netCDF bottle file are still present.			

Date	LastName	Data Type	Action	Summary
2004-01-29	Bartolacci	Cruise ID	Website Updated:	Public. Was pr16_00a, nowp16_1984a
	This cruise has been relabeled from pr16_00a to p16_1984a. All files have been renamed and/or remade to reflect this change. This cruise's data has been moved from the repeat data area to the new co2clivar data directories. All original files and notes regarding reformatting and other issues have been moved also. This cruise will not link to the public site until the change to the information has been entered into the database and the new web page has been made public.			
2004-03-29	Anderson	TRITUM	Data Update	Qual flags set to 2
	Merged the TRITUM and TRITER data I got from Lynne Talley into file p16_1984ahy.txt (Marathon II). There were no QUALT flags, so I set the Q1 and Q2 flags for TRITUM to 2. The files for this line still need to be linked.			
2004-03-30	Anderson	DELHE3	Data Update	Changed Q flags
	Changed Q1 and Q2 flage for DELHE3 at sta. 56, bottle 128 from 2 to 3 re email from Lynne Talley (below). Date: Mon, 29 Mar 2004 23:41:42 -0800 (PST) From: Lynne Talley <lynne@gyre.ucsd.edu> To: lynne@gyre.ucsd.edu, sharon@gyre.ucsd.edu, whpo@ucsd.edu Subject: p13 delhe3 flag sta 56 Sarilee - on P13, when the helium value at sta. 56, bottle 128, was flagged as "3", the DELHE3 value should also have been flagged as "3".			
2005-06-19	Talley	Cruise Report	Submitted	scan of hard copy
	Here are the first 19 pages of the data report from the 1984 occupation of P16. I will send over a copy for Kristin to keep in her files. The report includes a data listing for each station and a set of profiles for each station, which we have not scanned in.			